

lesson 4

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Identifying Characteristics of Ports and Cables

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Definitions

- **A port is** a generic name for any connector on a computer into which a cable can be plugged.
- **A cable** is simply a way of connecting a peripheral or other device to a computer using multiple copper or fiber-optic conductors inside a common wrapping or sheath.

Typically, cables connect two ports:

- one on the computer
- and one on some other device.

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Peripheral Port Connector Types

- D-subminiature
- RJ-series
- Other types

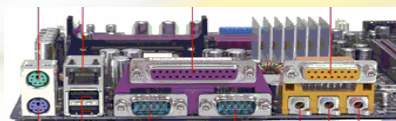
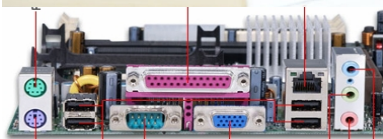
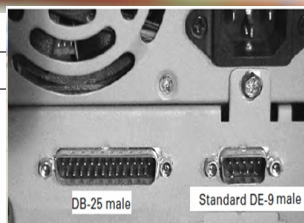
D-subminiature



- designated with **DX_n**,
- D-sub connectors are usually shaped like a trapezoid
- The nice part about these connectors is that only one orientation is possible.
- **letter X** is replaced by the letters **A** through **E**, which refer to the size of the connector,
- **letter n** is replaced by the number of pins or sockets in the connector.

Common D-sub Connectors

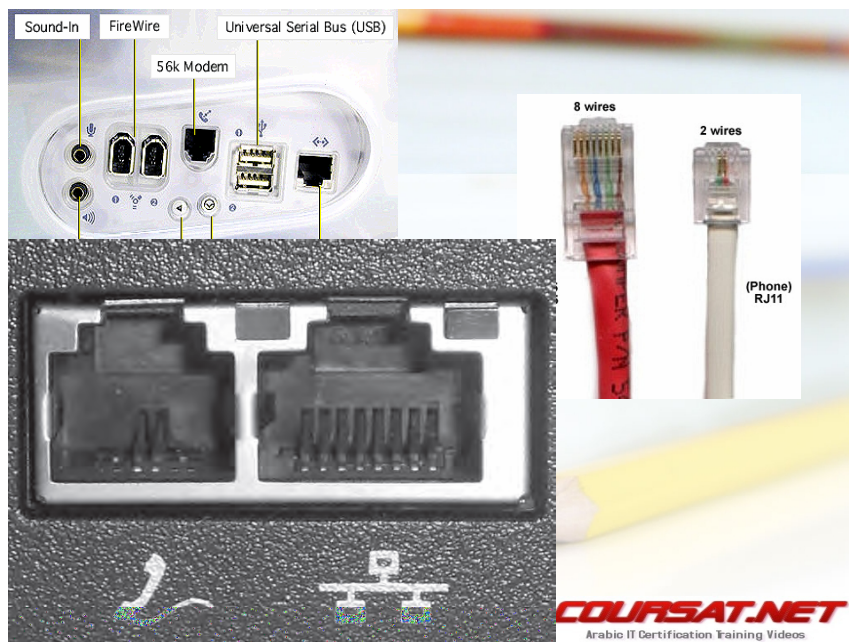
Connector	Gender	Use
DE9	Male	Serial port
DE9	Female	Connector on a serial cable
DB25	Male	Serial port or connector on a parallel cable
DB25	Female	Parallel port, or connector on a serial cable
DA15	Female	Game port or MIDI port
DA15	Male	Connector on a game peripheral cable or MIDI cable
DE15	Female	Video port (has three rows of 5 pins as opposed to two rows)
DE15	Male	Connector on a monitor cable



RJ-series

- Registered jack (RJ) connectors are most often used in telecommunications.

RJ-11	RJ-45
used for telephone cables	used with twisted-pair network cabling
up to six wires, but in telephone cable applications only two or four wires are used	They can accommodate up to eight wires



Other Types of Ports

- Universal Serial Bus (USB)
- IEEE 1394 (FireWire)
- Infrared
- Audio jacks
- PS/2 (mini-DIN)
- Centronics

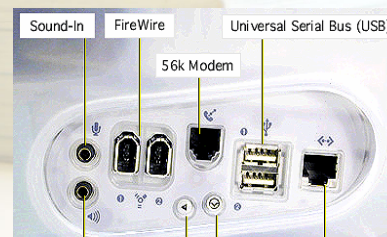
Universal Serial Bus (USB)

- Used with Digital cameras, external hard drives
- **USB offers many advantages**
 1. including faster speeds
 2. bidirectional communications
 3. powered connections (USB one power one data)
 4. USB devices can be attached with the computer running.
 5. plug-and-play support.
- they are used for connecting multiple (up to 127) peripherals to one computer through a single port (and the use of multiport peripheral *hubs*).



IEEE 1394 (FireWire)

- is a **hot-swappable** interface used for installing all manner of **external devices**, from **hard disk drives** to **digital cameras**



Infrared

Infrared Data Association (IrDA)

- An infrared (IR) port is a small port on the computer that allows data to be sent and received using electromagnetic radiation in the infrared band.
- Infrared ports send and receive data at a very slow rate (the maximum speed on PC infrared ports is less than 4Mbps).
- Infrared is generally used for point-to-point communications such as controlling the volume on a device with a handheld remote control.

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Audio/Video Jacks

- are used to transmit both audio and video information. *S/PDIF*

An RCA jack (female) and RCA plug (male)



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PS/2 (Keyboard and Mouse)

A *PS/2* port (also known as a mini DIN 6 connector)

the DIN-5 keyboard port

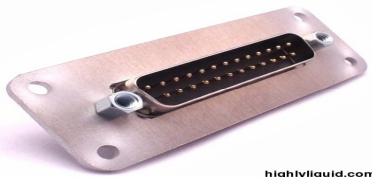
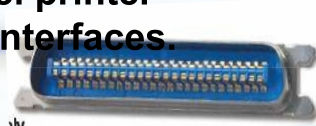


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Centronics



- The Centronics connector was primarily used in parallel printer connections and SCSI interfaces.
- It is most often found on peripherals, not on computers themselves



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Common Peripheral Interfaces and Cables

- interface is a method of connecting two dissimilar items together.
- A peripheral interface is a method of connecting a peripheral or accessory to a computer, including the specification of cabling, connector and port type, speed, and method of communication used.
- The most common interfaces used in PCs today include:
 - Parallel
 - Serial
 - USB
 - IEEE 1394 (FireWire)
 - Infrared
 - RCA
 - PS/2

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Parallel

- The most common use of the parallel interface is printer communication.
- There are three major types:
 1. standard,
 2. bidirectional,
 3. enhanced parallel ports.
 - EPP
 - ECP

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1-Standard Parallel Ports

- is commonly used to transmit data to printers.
- The standard parallel port only transmits data *out* of the computer
- It can transmit data at 150KBps
- technology also had a maximum transmission distance of 10 feet.

2-Bidirectional Parallel Ports

- it can both transmit and receive data.
- These parallel ports are capable of interfacing with such devices as external CD-ROM drives and external parallel port backup drives (Zip, Jaz, and tape drives).
- In order for bidirectional communication to occur properly, the cable must support bidirectional communication as well.

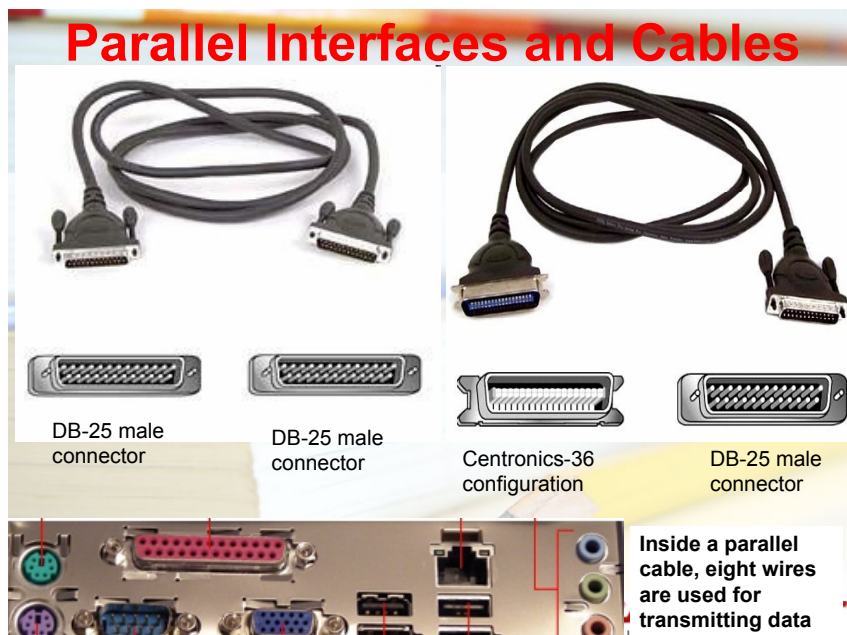
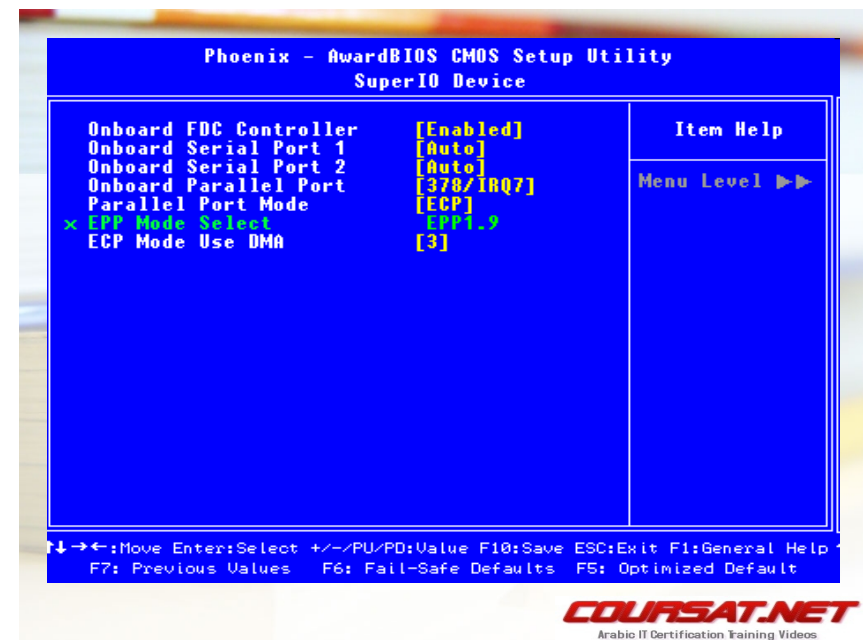
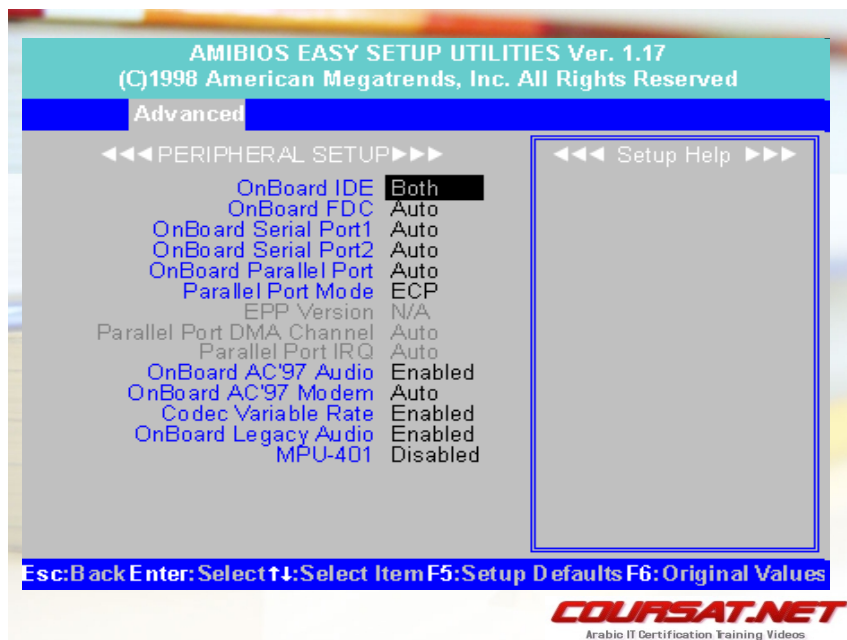
3- Enhanced Parallel Ports(IEEE 1284)

- provides for greater data transfer speeds and the ability to send memory addresses as well as data through a parallel port.
- ports are backward compatible with the standard and bidirectional ports and support cable lengths of 4.5 meters, which is almost 15 feet

There are two implementations of IEEE 1284:

EPP	ECP
enhanced parallel port (EPP)	An enhanced capabilities port
increases bidirectional throughput from 150KBps to anywhere from 600KBps to 1.5MBp	around 2MBps.
	ECP uses direct memory access (DMA)

The cable must also have full support for IEEE 1284 in order for proper communications to occur in both directions and at rated speeds.

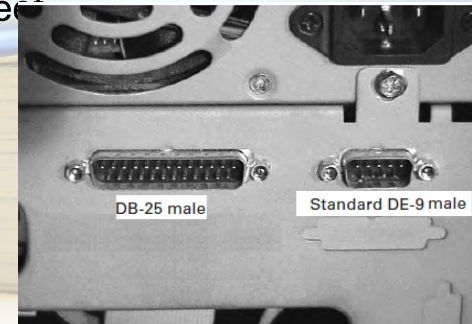


Serial

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Standard Serial

- maximum data transmission speed of 57Kbps and a maximum cable length of 50 feet



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Serial cables come in two common wiring configurations

standard serial cable	null modem serial cable
modems and printers to a computer	is used to hook two computers together without a modem.
A standard serial cable wiring diagram	A null modem serial cable wiring diagram

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Common Serial Cable Configurations

1st Connector	2nd Connector	Description
DE-9 female	DB-25 male	Standard modem cable
DE-9 female	DE-9 male	Standard serial extension cable
DE-9 female	DE-9 female	Null modem cable
DB-25 female	DB-25 female	Null modem cable
DB-25 female	DB-25 male	Standard serial cable or standard serial extension cable

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Universal Serial Bus (USB)

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- **There are currently two versions of USB available.**

1. USB 1.1 has a speed of 12 Mbps
2. USB 2.0 has a maximum speed of 480 Mbps.
3. A **SuperSpeed** (USB 3.0) rate of 5.0 Gbit/s.

Note : The USB 2.0 standard (also referred to as Hi-Speed USB) is designed to be backward compatible from the peripheral end

- **Notes**

- USB 2.0 uses the same physical connection as the original USB, but it is much higher in transfer rates and requires a cable with more shielding that is less susceptible to noise.

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These icons identify USB cables, connectors, hubs, and peripherals.



Supports USB 1.x



Supports USB 2.0 and 1.x



The USB 3.0 Icon

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- The USB standard specifies two broad types of connectors.
- They are designated Type A and Type B connectors

Type A
Standard Mini-B
Type B
Alternate Mini-B



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USB hub



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FireWire

i.LINK

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	Maximum number of devices	length	Transfer rate
IEEE 1394a (also called i.LINK or FireWire 400)	63	4.5 meters	400Mbps (50MBps)
IEEE 1394b (also called FireWire 800)	63	100 meters	800Mbps (100MBps)

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RCA

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- The RCA cable is simple. There are two connectors, usually male, one on each end of the cable.
- The male connector connects to the female connector on the equipment



An RCA male-to-RCA female connector is also available;
it's used to extend the reach of audio or video

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PS/2 (Keyboard and Mouse)

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